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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/197,314	11/20/1998	SANTHANA KRISHNAMACHARI	PHA-23.543	1130

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CORPORATE PATENT COUNSEL
US PHILIPS CORPORATION
INTELLECTUAL PROPERTY DEPARTMENT
580 WHITE PLAINS ROAD
TARRYTOWN, NY 10591

EXAMINER
LEE, RICHARD J

ART UNIT	PAPER NUMBER
2613	

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Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.	Applicant(s)
09/197,314	Krishnamachari
Examiner	**Art Unit**
Richard Lee	2613

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *9/13/01, 10/4/01, and 11/7/01* .

2a) ☐ This action is **FINAL.** 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-7, 9-20, 22-33, 35-40, and 42-47* is/are pending in the application.

4a) Of the above, claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-7, 9-20, 22-33, 35-40, and 42-47* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a) ☐ All b) ☐ Some* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) ☐ Notice of References Cited (PTO-892)
16) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____
18) ☐ Interview Summary (PTO-413) Paper No(s). _____
19) ☐ Notice of Informal Patent Application (PTO-152)
20) ☐ Other:

1. The request filed on March 19, 2002 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 09/197,314 is acceptable and a CPA has been established. An action on the CPA follows.

2. The drawings are objected to because references to elements "71", "73", and "75" as shown at page 19, lines 9-13 of the Specification is not shown in any of the figures of the drawings. Correction is required.

3. Claims 31, 38, 39, and 42 are objected to because of the following informalities:

(1) claim 31, line 1, "method" should be changed to "apparatus" for clarity (see claim 27);

(2) claim 38, line 1, "method" should be changed to "apparatus" for clarity (see claim 27);

(3) claim 39, line 1, "method" should be changed to "apparatus" for clarity (see claim 27); and

(4) claim 42, line 16, "(N^3 1)" should be changed to "($N \geq 1$)" for clarity. Appropriate correction is required.

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-6, 9-19, 22-26, 40, 45, and 46 are rejected under 35 U.S.C. 102(b) as being anticipated by Ueno et al of record (5,418,570).

Ueno et al discloses a motion picture coding apparatus as shown in Figures 1, 7, 13, 15, and 18-21, and the same apparatus, method, and computer executable process steps stored on a computer readable medium as claimed in claims 1-6, 9-19, 22-26, 40, 45, and 46, the computer executable process steps to increase a resolution of at least a portion of a reference frame of video (see 35 of Figures 7 and 13, 60 of Figure 15), the apparatus, method, and computer executable process comprising the same selecting a first block of pixels in the reference frame (see columns 1-2, column 15, lines 33-41, column 16, lines 8-20); locating in N target frames one or more blocks of pixels that substantially correspond to the first block of pixels, where the N target frames are separate from the reference frame (i.e., search range calculation within coding section 30 of Figures 7 and 13, see column 15, lines 33-41); determining values of additional pixels based on values of pixels in the first block and on values of pixels in the one or more blocks, adding the additional pixels among the pixels in the first block, determining the values of the additional pixels based also on coefficients which are weighted in accordance with the first block and the one or more blocks, wherein the coefficients are weighted based on differences between pixels in the first block and pixels in each of the one or more blocks, wherein the differences comprise a residual (i.e., 35 of Figures 7 and 13, 60 of Figure 15, Figures 18-21, and see columns 1-2, columns 7-8, columns 15-16, columns 19-21); wherein the N target frames comprise frames of video which were predicted at least in part based on pixels in the reference frame (see column 16, lines 8-20);

wherein in a case that the locating step does not locate any blocks of pixels in the target frames that substantially correspond to the first block of pixels, the determining step determines the values of the additional pixels based on values of pixels in the first block without regard to values of pixels in the N target frames (i.e., I frame processing, see column 2, lines 31-39); changing distances between pixels in the first block in order to change a size of the first block (see Figures 18-21, column 19-21); wherein the locating step uses motion vectors from the reference frame to the target frame to locate the one or more blocks of pixels and searches through the N target frames to locate the one or more blocks of pixels (see column 15, lines 33-41); the locating step locates one or more blocks using motion vectors present in an coded bitstream for target frames and wherein the coefficients are determined using DCT values of at least one coded residual, where the at least one coded residual comprises differences between the reference frame and the target frames (see column 15, lines 33-41, column 20, lines 54-68, Figures 7, 13, 15, 18-21); and wherein the reference frame comprises a B frame, and wherein before the selecting step, the step of determining a location of the first block in the reference frame based on blocks of pixels in frames which precede and which follow the reference frame (i.e., bidirectional prediction, see column 16, lines 8-20); and wherein the reference frame comprises one of an I frame and P frame, and wherein the N target frames comprise at least one of a P frame and a bi-directional frame (see column 2, lines 31-39, column 16, lines 8-20).

6. Claims 42 and 43 are rejected under 35 U.S.C. 102(b) as being anticipated by Yonemitsu et al of record (5,475,435).

Yonemitsu et al discloses a layer encoding and decoding apparatus as shown in Figures 1 and 2, and the same television system which receives coded video data (see column 1 and Figure 2), and which forms images based on the coded video data, the television system comprising a decoder (see Figure 2) which decodes the video data to produce frames of video; a processor (55, 57 of Figure 2) which increases a resolution of a reference frame of video based on pixels in the reference frame and based on pixels in at least one other target frame of the video, wherein the processor increases the resolution of the reference frame by selecting blocks of pixels in the reference frame and for each selected block, locating in N target frames one or more blocks of pixels that substantially correspond to the first block of pixels, where the N target frames are separate from the reference frame (see column 2, lines 44-54, column 3, lines 25-35, column 4, lines 53-63, column 6, line 34 to column 7, line 63), and determining values of additional pixels based on values of pixels in the selected block and on values of pixels in the one or more blocks and adding the additional pixels among the pixels in the selected block (i.e., interpolation within upsampling circuit 57 of Figure 2); a display which displays an image based on the reference frame (see column 1 and Figure 2); and wherein in a case that the processor does not locate any blocks of pixels in the target frames that substantially correspond to the selected block of pixels, the processor determines the values of the additional pixels based on values of pixels in the

selected block without regard to values of pixels in the N target frames (i.e., I frame processing as determined from the macroblock type signal, see column 2, lines 55-62, column 6, lines 34-44).

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 7 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno et al as applied to claims 1-6, 9-19, 22-26, 40, 45, and 46 in the above paragraph (5), and further in view of Guetz et al of record (6,091,777).

Ueno et al discloses substantially the same apparatus, method, and computer executable process steps as above, but does not particularly disclose determining the values of the additional pixels by performing bilinear interpolation using at least some of the pixels in the first block as claimed in claims 7 and 20. However, Guetz et al discloses a continuously adaptive digital video compression system and teaches the conventional use of bilinear interpolation associated with motion estimation of blocks (see column 2, lines 23-47). Therefore, it would have been obvious to one of ordinary skill in the art, having the Ueno et al and Guetz et al references in front of him/her and the general knowledge of the interpolation of images, would have had no difficulty in providing the bilinear interpolation of image data as taught by Guetz et al as part of the motion estimation of pixel data within the system of Ueno et al for the same well known image interpolation purposes as claimed.

9. Claims 27-32, 35-39, and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno et al as applied to claims 1-6, 9-19, 22-26, 40, 45, and 46 in the above paragraph (5), and further in view of Lempel of record (6,163,576).

Ueno et al discloses substantially the same apparatus, method, and computer executable process steps as above, but does not particularly a memory which stores computer executable process steps as claimed in claim 27. However, Lempel discloses a video encoder having reduced memory bandwidth requirements, and teaches the conventional use of a CPU 202 of Figure 2 for storing and executing computer processes. Therefore, it would have been obvious to one of ordinary skill in the art, having the Ueno et al and Lempel references in front of him/her, would have had no difficulty in providing the computer memory storage of executable processes as taught by Lempel for the video image processing system of Ueno et al for the same well known purposes as claimed.

10. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Ueno et al and Lempel as applied to claims 1-6, 9-19, 22-32, 35-40, and 45-47 in the above paragraphs (5) and (9), and further in view of Guetz et al of record (6,091,777).

The combination of Ueno et al and Lempel discloses substantially the same apparatus, method, and computer executable process steps as above, but does not particularly disclose determining the values of the additional pixels by performing bilinear interpolation using at least some of the pixels in the first block as claimed in claim 33. However, Guetz et al discloses a continuously adaptive digital video compression system and teaches the conventional use of

bilinear interpolation associated with motion estimation of blocks (see column 2, lines 23-47). Therefore, it would have been obvious to one of ordinary skill in the art, having the Ueno et al, Lempel, and Guetz et al references in front of him/her and the general knowledge of the interpolation of images, would have had no difficulty in providing the bilinear interpolation of image data as taught by Guetz et al as part of the motion estimation of pixel data within the system of Ueno et al for the same well known image interpolation purposes as claimed.

11. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yonemitsu et al as applied to claims 42 and 43 in the above paragraph (6), and further in view of Song et al of record (6,115,070).

Yonemitsu et al discloses substantially the same television system as above, but does not particularly disclose wherein the decoder and the processor are implemented in a settop box as claimed in claim 44. Such decoder and processing within a settop box is however old and well recognized in the art, as exemplified by Song et al (See Figure 24 and column 24, line 64 to column 25, line 18. Therefore, it would have been obvious to one of ordinary skill in the art, having the Yonemitsu et al and Song et al references in front of him/her and the general knowledge of settop box functions, would have had no difficulty in providing the settop box with decoder and processing capabilities as taught by Song et al for the video image system of Yonemitsu et al for the same well known MPEG compliant decoding purposes as claimed.

12. Regarding the applicant's arguments at pages 5-6 of the amendment filed September 13, 2001 concerning in general that "... it is respectfully submitted that the claims recite features not

taught by Ueno et al. In particular such features include "determining values of additional pixels based on values of pixels in the first block and on values of pixels in the one or more blocks", as recited in claims 1, 14, 27 and 40 ... However, in reviewing these portions of Ueno et al, nowhere is such a feature taught or suggested. For example, in column 19, Ueno et al only discloses that a signal 401 is obtained by horizontal up-sampling of the low resolution local decoded signal 56 ... Therefore, it is respectfully submitted that this feature is distinguishable over Ueno et al ...", the Examiner respectfully disagrees. The low resolution local decoded signal 34 output from the local decoder 33 as shown in Figure 7 of Ueno et al is actually based on first blocks of pixels in the reference frame and one or more blocks of pixels that substantially correspond to the first block of pixels as provided by the search range calculation within coding section 30 of Figure 7 of Ueno et al (see column 14, lines 33-41, column 16, lines 8-20). The low resolution local decoded signal is further upsampled by upsampling circuit 35 of Figure 7 of Ueno et al (see also Figure 15), thereby adding pixels to the low resolution local decoded signal (see columns 19-20 and Figure 18). As such, it is submitted that upsampling circuit 35 of Figure 7 of Ueno et al shows the same "determining values of additional pixels based on values of pixels in the first block and on values of pixels in the one or more blocks" as claimed.

Regarding the applicant's arguments at pages 6-7 of the amendment filed September 13, 2001 concerning in general that "... it is respectfully submitted that the claims recite features neither taught nor suggested by Yonemitsu et al. In particular, such features include "locating, in N target frames, one or more blocks of pixels that substantially correspond to the first block of

pixels". In column 3, lines 50-56, Yonemitsu et al discloses that the up-sampling circuit adaptively refers to both of a picture from the upper layer .. And another picture from the lower layer ... However, nowhere does Yonemitsu et al disclose that the up sampling circuit perform "locating, in N target frames, one or more blocks of pixels that substantially correspond to the first block of pixels", as required by the claims ...", the Examiner respectfully disagrees. It is submitted that the motion compensation decoding 55 of Figure 2 of Yonemitsu et al, by decoding the motion vector provided by the motion estimation process of the encoder (see column 2, lines 44-54, column 3, lines 25-35, column 4, lines 53-63, column 6, line 34 to column 7, line 63), one or more blocks of pixels from the target frames are being located that substantially corresponds to the first block of pixels. In other words, the motion estimator locates the one or more blocks of pixels in the target frames that substantially correspond to the first block of pixels, and the motion vector output from the motion estimator identifies such one or more blocks of pixels in the target frames for the decoder. As such, it is further submitted that the claimed limitations are rendered anticipated by Yonemitsu et al.

13. **Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314, (for formal communications intended for entry)

(for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington. VA., Sixth Floor (Receptionist).

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Lee whose telephone number is (703) 308-6612. The Examiner can normally be reached on Monday to Friday from 8:00 a.m. to 5:30 p.m, with alternate Fridays off.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group customer service whose telephone number is (703) 306-0377.

RICHARD LEE
PRIMARY EXAMINER

Richard Lee/rl

4/3/02